

Enectalí Figueroa

Laboratory for High Energy Astrophysics, Code 662
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Education

- Jul 2001 Doctor of Philosophy, Physics, Stanford University
Dissertation: *Theory and Development of Position-Sensitive Quantum Calorimeters*
Advisor: Blas Cabrera
- Dec 1997 Master of Science, Physics, Stanford University
- May 1995 Bachelor of Science, Mechanical Engineering, University of Puerto Rico at Mayagüez

Languages Fluent in English and Spanish; conversant in French; learning Russian

Flight Experience

75 hours in Cessna 152 and Cessna 172

Certifications

- Licensed private pilot for Airplane Single Engine Land; currently working on instrument rating
- Certified fireman
- Certified emergency medical technician (EMT)
- Certified open water SCUBA diver

Honors and Awards

- 2003 Elected president of the NASA Academy Alumni Association
- 2001 NASA Special Act Award (for proof-of-concept demonstrations of position-sensitive x-ray microcalorimeters)
- 2001 NASA Laboratory for High Energy Astrophysics Peer Award (for contributions to the long-term goals of the x-ray astrophysics branch)
- 2001 Commendation for service in the Fire Department of the City of Greenbelt during the September 11th attacks
- 2001 Physics PhD commencement speaker

Enectalí Figueroa

1995	BS magna cum laude
1995	Phi Kappa Phi National Honor Society
1994	Tau Beta Pi National Engineering Honor Society
1993	1 st Place, Imaginations National Design Competition (Walt Disney Imagineering)
1990–1995	National Dean's List
1990–1995	Mechanical Engineering Department's Honor Students List

Fellowships

1998–2001	NASA/Goddard Space Flight Center Cooperative Fellow
1998	Ford Foundation Fellow (declined)
1995–1998	NSF Graduate Research Fellow
1996	McMicking Fellow (Stanford University)
1997	Leiberman Fellow (Stanford University)
1994	Physics Research Fellow (Stanford University)
1991–1995	Research Careers for Minority Scholars Fellow (NSF)

Volunteer Work

2003–	President of the NASA Academy Alumni Association. The NASA Academy is a summer program aimed toward cultivating future leaders of the space program. The Alumni Association is a non-profit organization dedicated to promoting the NASA Academy and serving its past and present members.
1999–	Civil Air Patrol: 2 nd lieutenant in Maryland's 11th Squadron, pilot and aerospace education officer <ul style="list-style-type: none">• Lecture our squadron's cadets once a month on topics that range from building gliders to learning the principles of space flight.• Participate in search and rescue operations.
2000–	Fireman and ambulance officer in the Greenbelt Volunteer Fire Department's Engine Company 35 <ul style="list-style-type: none">• As a fireman, served in structural, automobile, and wild fires. During the September 11th attacks our company served in the fire suppression efforts at the Pentagon.• As an ambulance officer, stabilized and prevented further injury to a pedestrian hit by an automobile at high-speed. The patient was transported by medivac helicopter to the Shock Trauma Center in Baltimore. Delivered a beautiful baby girl after a mother called 911. The baby was crowning when we arrived at the scene and was born in her parents' hatchback.

1998– Member of the NASA Speakers Bureau and the American Physical Society's Minority Speakers List. Have presented to more than 1500 students and teachers from the elementary to college level about topics ranging from astrophysics to the importance of science and math in education. Delivered keynote address at the National Society of Black Physics Students Conference (2001), taught a one-week course on astronomy at the University of Puerto Rico (2001), gave keynote speech at the Mensa Regional Conference (2003), taught a course on x-ray detectors at the NASA International X-ray Astronomy School (2003), and gave the keynote speech at the International Astronomy Day in Puerto Rico (2003).

Work and Research Experience

11/01– **Astrophysicist, GS-13**
NASA Laboratory for High Energy Astrophysics
Goddard Space Flight Center, Mail Code 662, Greenbelt, MD 20771
Supervisor: Dr. Richard Kelley, (301) 286-7266

- Leader of the position-sensitive microcalorimeter team at Goddard. These detectors (devised as part of my PhD thesis) are a new type of imaging spectrometer being developed for Constellation-X, one of the two major observatories that form the core of NASA's Beyond Einstein Program. These detectors will increase the field of view of the Constellation-X mission by an order of magnitude, leading to a major increase in the science capability of the mission. Our microcalorimeters are fabricated lithographically in silicon wafers by the same technology used to make computer chips. They operate at 50 milli-Kelvin and are tested in cryogenic refrigerators of our design. Data is collected with state-of-the-art superconducting quantum interference devices (SQUIDS). I lead in the design, fabrication, testing, and operation of the devices and the cryogenic refrigerators needed to operate them.
- Member of the x-ray quantum calorimeter (XQC) rocket team. This rocket uses a microcalorimeter to take high-energy-resolution spectra of the soft x-ray background. The XQC has flown successfully twice and was the first microcalorimeter in space. The next XQC rocket launch is scheduled for early 2004.
- Member of the Astro-E2 facility science team. Astro-E2 is a joint Japan/USA x-ray astrophysics observatory to be launched in 2005. The main detector for this mission will be a 32-pixel microcalorimeter built by our group, and it will be the first orbiting microcalorimeter. I am involved in the design, fabrication, integration, calibration and operation of the flight hardware.

- I study the entropy profiles of groups of galaxies to elucidate the energy sources that contribute to their formation. This information is critical to understanding how groups and clusters of galaxies formed and may establish key contributors to the formation of structures in the universe. With this information we could use clusters of galaxies as cosmological probes to study the nature of *dark energy* (the mysterious force accelerating our universe).

06/98–11/01 **Cooperative Student Trainee in Physics, GS-11**
NASA Laboratory for High Energy Astrophysics
Goddard Space Flight Center, Mail Code 662, Greenbelt, MD 20771
Supervisor: Dr. Richard Kelley, (301) 286-7266
Reason for leaving: Promoted to above

- First graduate student selected by the Goddard Science Coop Program.
- Devised a new microcalorimeter (referred to above) that increased the focal-plane coverage by a factor of 5 over the current technologies. Received a NASA research grant and was the principal investigator in this effort. Designed the detectors and was an integral member of the team that fabricated and tested the devices. Derived the equations for predicting the noise performance and energy resolution of these new devices.
- Member of the XQC sounding rocket flight team. Participated in the mission readiness review, integration and testing of payload, horizontal and vertical rocket integration tests, vibration and balance tests, successful flight of the rocket, payload recovery, and data analysis.
- Designed a four-channel test platform that uses two-stage superconducting amplifiers for one of our dilution refrigerators. The new design facilitates the mounting and checkout of our detectors to the refrigerator and cuts installation time by a day, and it provides much more robust connections than our previous design.

09/97–06/98 **Graduate Student Researcher**
Physics Department, Stanford University
382 Via Pueblo Mall, Stanford, CA 94305-4060
Supervisor: Prof. Blas Cabrera, (650) 723-3395
Reason for leaving: Began research at NASA
Part of the team that developed a new optical energy-dispersive spectrometer that obtained the first simultaneous spectra of the Crab pulsar from the infrared to UV bands. These detectors use transition-edge sensors, which are superconducting devices that operate at very low temperatures. Became proficient in low temperature (milli-Kelvin) refrigeration techniques,

clean-room integrated circuit fabrication and state-of-the-art superconducting electronics.

09/96–08/97

Astronomy Teaching Assistant

Physics Department, Stanford University

382 Via Pueblo Mall, Stanford, CA 94305-4060

Supervisor: Prof. Arthur B. C. Walker, *deceased*

Reason for leaving: Returned to full-time research

Taught astronomy to Stanford undergraduates for three quarters, plus a summer course in astronomy for economically disadvantaged high school students. Operated the Stanford Student Observatory's 27-inch telescope and assisted students in their astronomy laboratory. My students calculated the mass of Jupiter, analyzed globular clusters and used parallax to calculate the distance to a nearby asteroid.

09/95–06/97

Graduate Student Researcher

Physics Department, Stanford University

382 Via Pueblo Mall, Stanford, CA 94305-4060

Supervisor: Prof. Arthur B. C. Walker, *deceased*

Reason for leaving: Rotated to Prof. Cabrera's group

Analyzed the multi-spectral solar telescope array (MSSTA) sounding rocket data. Calibrated the hardware after the successful 1994 flight. The payload was an ensemble of 15 telescopes for obtaining multi-wavelength high-resolution images of the Sun in the soft x-ray and UV bands. Calibrated the telescope filters, mirrors, and photographic film at the Stanford Synchrotron Radiation Laboratory (SSRL) by using x-rays from the SSRL storage ring to obtain their transmission and reflection characteristics. With this data we determined the solar flux at the MSSTA wavelengths. Became proficient in high-vacuum equipment operation and design.

06/96–09/96

Research Assistant

NASA JSC Advanced Space Propulsion Laboratory

Johnson Space Center

Code CB/ASPL, 2101 NASA Road 1, Houston TX 77058

Supervisor: Dr. Franklin Chang-Díaz, (281) 792-5536

Reason for leaving: Summer internship

Worked on the variable-specific-impulse magnetoplasma rocket (VASIMR). Operated the plasma rocket and developed standard operating procedures for plasma creation in the main vacuum chamber. Operated and performed maintenance on laboratory equipment, including the cryogenic magnets, the high-vacuum turbo pumps and the gate valves. Aided in the installation of a 14.5 GHz microwave Klystron for ion cyclotron resonance heating, and the installation of the current exhaust vacuum tank on the plasma rocket.

Enectalí Figueroa

- 06/95–09/95 **NASA Academy Research Associate**
NASA Laboratory for Astronomy and Solar Physics
Goddard Space Flight Center, Mail Code 686, Greenbelt, MD 20771
Supervisor: Dr. Daniel Gezari, (301) 286-3432
Reason for leaving: *Summer program*
Designed the thermal collimator for an infrared telescope for the South Pole. A thermal collimator was required to allow a stable layer of air to form between the optics in the telescope barrel (at 77 Kelvin) and the outside air.
- 06/94–08/94 **Physics Research Fellow**
Physics Department, Stanford University
382 Via Pueblo Mall, Stanford, CA 94305-4060
Supervisor: Prof. Arthur B. C. Walker, *deceased*
Reason for leaving: *Undergraduate summer internship*
Integrated rocket flight hardware and electronics for the MSSTA sounding rocket payload, and designed and wrote software analysis programs. The image analysis software was used to transform the spherical solar images into planar projections and to calculate the actual solar x-ray flux.
- 06/93–12/93 **Cooperative Program Intern in Mechanical Engineering**
Walt Disney Imagineering
1401 Flower Street, P.O. Box 25020, Glendale, CA 91221-5020
Reason for leaving: *Six-month program*
Worked on designing a new roller coaster for the Animal Kingdom Park. Calculated energy balances to ensure that the acceleration of the coaster was within specifications. In charge of emergency exit scenarios, including emergency brake location, safe egress for passengers, and safety personnel access to immobilized roller coaster cars. Extensive CAD work with Autocad and Pro-Engineer software.
- 01/93–06/95 **Research Assistant**
University of Puerto Rico
Mechanical Engineering Department, P.O. Box 9044, Mayagüez, PR 00681
Supervisor: Prof. Mazumdar
Reason for leaving: *Graduation*
Worked in the university's materials testing laboratory doing strain, fatigue and fracture propagation experiments on aluminum-lithium alloys for the United States Air Force.
- 1992 **Engineering Intern**
Fermi National Accelerator Laboratory
P.O. Box 500, Batavia, IL 60510-0500
Reason for leaving: *Summer internship*
Worked on the design of the cryostat for the main detector of the supercon-

ducting super collider. Designed and performed an experiment to evaluate various mating designs and materials for the cryostat body/lid interface.

Refereed Papers

R. Mushotzky, E. Figueroa-Feliciano, M. Loewenstein, and S. L. Snowden. **Groups and the entropy floor—XMM-Newton observations of two groups.** *Astrophysical Journal*, in press.

D. McCammon, R. Almy, E. Apodaca, W. Bergmann Tiest, W. Cui, S. Deiker, M. Galeazzi, M. Juda, A. Lesser, T. Mihara, J. P. Morgenthaler, W. T. Sanders, J. Zhang, E. Figueroa-Feliciano, R. L. Kelley, S. H. Moseley, R. F. Mushotzky, F. S. Porter, C. K. Stahle, and A. E. Szymkowiak. **A high spectral resolution observation of the soft x-ray diffuse background with thermal detectors.** *Astrophysical Journal*, 576:188–203, 2002.

R. W. Romani, A. J. Miller, B. Cabrera, E. Figueroa-Feliciano, and S. W. Nam. **First astronomical application of a cryogenic transition edge sensor spectrophotometer.** *Astrophysical Journal Letters*, 521:L153–L156, 1999.

M. A. Lindeman, S. Bandler, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, M. J. Li, and C. K. Stahle. **Impedance measurements and modeling of a TES calorimeter.** *Journal of Applied Physics*, submitted.

Book Chapter

M. Galeazzi and E. Figueroa-Feliciano. **Advances in X-Ray Devices**, chapter 4: Cryogenic Microcalorimeters. John Wiley & Sons, in press.

Refereed Conference Proceedings

S. R. Bandler, E. Figueroa-Feliciano, C. K. Stahle, K. Boyce, R. Brekosky, J. Chervenak, F. Finkbeiner, R. Kelley, M. Lindeman, F. S. Porter, and T. Saab. **Design of transition edge sensor microcalorimeters for optimal performance.** *Nuclear Instruments and Methods in Physics Research A*, 520:285–288, 2004.

J. A. Chervenak, F. M. Finkbeiner, T. R. Stevenson, D. J. Talley, R. P. Brekosky, S. R. Bandler, E. Figueroa-Feliciano, M. A. Lindeman, R. L. Kelley, T. Saab, and C. K. Stahle. **Fabrication of transition edge sensor X-ray microcalorimeters for Constellation-X.** *Nuclear Instruments and Methods in Physics Research A*, 520:460–462, 2004.

J. Cottam, K. R. Boyce, G. V. Brown, E. Figueroa-Feliciano, R. L. Kelley, V. Ponce, F. S. Porter, C. K. Stahle, and W. A. Tillotson. **Characterization of the Astro-E2 X-ray spectrometer.** *Nuclear Instruments and Methods in Physics Research A*, 520:368–371, 2004.

E. Figueroa-Feliciano. **Position-sensitive low-temperature detectors.** *Nuclear Instruments and Methods in Physics Research A*, 520:496–501, 2004.

- E. Figueroa-Feliciano, S. Bandler, K. Boyce, J. Chervenak, F. Finkbeiner, R. Kelley, M. A. Lindeman, S. F. Porter, T. Saab, and C. K. Stahle. **Effect of high-flux astronomical sources on the Constellation-X microcalorimeter spectrometer.** *Nuclear Instruments and Methods in Physics Research A*, 520:303–306, 2004.
- F. M. Finkbeiner, C. Adams, E. Apodaca, J. A. Chervenak, J. Fischer, N. Doan, M. J. Li, C. K. Stahle, R. P. Brekosky, S. R. Bandler, E. Figueroa-Feliciano, M. A. Lindeman, R. L. Kelley, T. Saab, and D. J. Talley. **Development of ultra-low impedance through-wafer micro-vias.** *Nuclear Instruments and Methods in Physics Research A*, 520:463–465, 2004.
- D. J. Fixsen, S. H. Moseley, B. Cabrera, and E. Figueroa-Feliciano. **Pulse estimation in nonlinear detectors with nonstationary noise.** *Nuclear Instruments and Methods in Physics Research A*, 520:555–558, 2004.
- M. Galeazzi, K. R. Boyce, G. V. Brown, C. Chen, J. Cottam, E. Figueroa-Feliciano, M. B. Jacobson, R. L. Kelley, D. Liu, D. McCammon, F. S. Porter, L. E. Rocks, C. K. Stahle, A. E. Szymkowiak, and J. E. Vaillancourt. **Design of the second generation XRS detector.** *Nuclear Instruments and Methods in Physics Research A*, 520:469–471, 2004.
- C. Hammock, E. Figueroa-Feliciano, E. Apodaca, S. Bandler, K. Boyce, J. Chervenak, F. Finkbeiner, R. Kelley, M. Lindeman, S. Porter, T. Saab, and C. Stahle. **Position-sensitive transition edge sensor modeling and results.** *Nuclear Instruments and Methods in Physics Research A*, 520:505–507, 2004.
- M. A. Lindeman, S. Bandler, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, R. L. Kelley, T. Saab, C. K. Stahle, and D. J. Talley. **Performance of compact TES arrays with integrated high-fill-fraction X-ray absorbers.** *Nuclear Instruments and Methods in Physics Research A*, 520:411–413, 2004.
- M. A. Lindeman, S. Bandler, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, T. Saab, and C. K. Stahle. **Characterization and reduction of noise in Mo/Au transition edge sensors.** *Nuclear Instruments and Methods in Physics Research A*, 520:348–350, 2004.
- T. Saab, E. Apodacas, S. R. Bandler, K. Boyce, J. Chervenak, E. Figueroa-Feliciano, F. Finkbeiner, C. Hammock, R. Kelley, M. Lindeman, F. S. Porter, and C. K. Stahle. **Characterization and modeling of transition edge sensors for high resolution X-ray calorimeter arrays.** *Nuclear Instruments and Methods in Physics Research A*, 520:281–284, 2004.
- C. K. Stahle, C. A. Allen, K. R. Boyce, R. P. Brekosky, G. V. Brown, J. Cottam, E. Figueroa-Feliciano, M. Galeazzi, J. D. Gygax, M. B. Jacobson, R. L. Kelley, D. Liu, D. McCammon, R. A. McClanahan, S. H. Moseley, F. S. Porter, L. E. Rocks, A. E. Szymkowiak, and J. E. Vaillancourt. **The next-generation micro-**

calorimeter array of XRS on Astro-E2. *Nuclear Instruments and Methods in Physics Research A*, 520:466–468, 2004.

C. K. Stahle, K. R. Boyce, G. V. Brown, J. Cottam, E. Figueroa-Feliciano, M. Galeazzi, R. L. Kelley, D. McCammon, F. S. Porter, A. E. Szymkowiak, and W. A. Tillotson. **Cosmic ray effects in microcalorimeter arrays.** *Nuclear Instruments and Methods in Physics Research A*, 520:472–474, 2004.

W. A. Tillotson, K. R. Boyce, G. V. Brown, J. Cottam, E. Figueroa-Feliciano, R. L. Kelley, F. S. Porter, and C. K. Stahle. **Energy scales in X-ray microcalorimeters.** *Nuclear Instruments and Methods in Physics Research A*, 520:595–598, 2004.

K. R. Boyce, E. Figueroa-Feliciano, F. M. Finkbeiner, K. C. Gendreau, R. L. Kelley, M. A. Lindeman, F. S. Porter, C. K. Stahle, and A. E. Szymkowiak. **Data processing for large fast microcalorimeter arrays.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 343. AIP Conf. Proc., 2002.

E. Figueroa-Feliciano, J. Chervenak, F. M. Finkbeiner, M. Li, M. A. Lindeman, C. K. Stahle, and C. M. Stahle. **First results from position-sensitive quantum calorimeters using Mo/Au transition-edge sensors.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 239. AIP Conf. Proc., 2002.

F. M. Finkbeiner, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, M. J. Li, M. A. Lindeman, C. K. Stahle, C. M. Stahle, and N. Tralshawala. **Fabrication of close-packed TES microcalorimeter arrays using superconducting molybdenum/gold transition-edge sensors.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 215. AIP Conf. Proc., 2002.

D. J. Fixsen, S. H. Moseley, B. Cabrera, and E. Figueroa-Feliciano. **Optimal fitting of non-linear detector pulses with nonstationary noise.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 339. AIP Conf. Proc., 2002.

M. Galeazzi, E. Figueroa-Feliciano, D. Liu, D. McCammon, W. T. Sanders, C. K. Stahle, and P. Tan. **Performance modeling of microcalorimeter detectors.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 95. AIP Conf. Proc., 2002.

M. A. Lindeman, R. P. Brekosky, E. Figueroa-Feliciano, F. M. Finkbeiner, M. Li, C. K. Stahle, C. M. Stahle, and N. Tralshawala. **Detailed characterization of Mo/Au TES microcalorimeters.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 219. AIP Conf. Proc., 2002.

M. A. Lindeman, R. P. Brekosky, E. Figueroa-Feliciano, F. M. Finkbeiner, M. Li, C. K. Stahle, C. M. Stahle, and N. Tralshawala. **Performance of Mo/Au TES microcalorimeters.** In *Low Temperature Detectors (LTD-9)*, volume 605, page 203. AIP Conf. Proc., 2002.

C. K. Stahle, M. A. Lindeman, E. Figueroa-Feliciano, M. J. Li, N. Tralshawala, F. M. Finkbeiner, R. P. Brekosky, and J. A. Chervenak. **Arraying compact pixels of transition-edge microcalorimeters for imaging x-ray spectroscopy.**

In *Low Temperature Detectors (LTD-9)*, volume 605, page 223. AIP Conf. Proc., 2002.

K. R. Boyce, K. A. Irwin, E. Figueroa-Feliciano, F. M. Finkbeiner, K. C. Gendreau, R. L. Kelley, M. A. Lindeman, F. S. Porter, C. K. Stahle, and A. E. Szymkowiak. **Data handling considerations for large microcalorimeter arrays**. In *ASP Conf. Ser. 251: New Century of X-ray Astronomy*, page 522, 2001.

E. Figueroa-Feliciano, C. K. Stahle, F. M. Finkbeiner, M. Li, M. A. Lindeman, N. Tralshawala, and C. M. Stahle. **First light of position-sensing transition-edge sensors**. In *ASP Conf. Ser. 251: New Century of X-ray Astronomy*, page 532, 2001.

C. K. Stahle, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, J. D. Gygax, R. L. Kelley, M. J. Li, M. A. Lindeman, C. M. Stahle, and N. Tralshawala. **Progress in developing close-packed x-ray microcalorimeter arrays of Mo/Au transition-edge sensors**. In *ASP Conf. Ser. 251: New Century of X-ray Astronomy*, page 188, 2001.

E. Figueroa-Feliciano, B. Cabrera, A. J. Miller, S. F. Powell, T. Saab, and A. B. C. Walker. **Optimal filter analysis of energy-dependent pulse shapes and its application to TES detectors**. *Nuclear Instruments and Methods in Physics Research A*, 444:453–456, 2000.

A. J. Miller, B. Cabrera, R. W. Romani, E. Figueroa-Feliciano, S. W. Nam, and R. M. Clarke. **Development of wide-band, time and energy resolving, optical photon detectors with application to imaging astronomy**. *Nuclear Instruments and Methods in Physics Research A*, 444:445–448, 2000.

F. S. Porter, R. Almy, E. Apodaca, E. Figueroa-Feliciano, M. Galeazzi, R. Kelley, D. McCammon, C. K. Stahle, A. E. Szymkowiak, and W. T. Sanders. **Observations of the soft X-ray background with the XQC microcalorimeter sounding rocket**. *Nuclear Instruments and Methods in Physics Research A*, 444:175–179, 2000.

F. S. Porter, R. Almy, E. Apodaca, E. Figueroa-Feliciano, M. Galeazzi, R. Kelley, D. McCammon, C. K. Stahle, A. E. Szymkowiak, and W. T. Sanders. **The XQC microcalorimeter sounding rocket: a stable LTD platform 30 seconds after rocket motor burnout**. *Nuclear Instruments and Methods in Physics Research A*, 444:220–223, 2000.

Non-Refereed Conference Proceedings

J. Cottam, K. R. Boyce, G. V. Brown, E. Figueroa-Feliciano, T. Furusho, R. L. Kelley, F. S. Porter, C. K. Stahle, and W. A. Tillotson. **Calibration and characterization of the XRS spectrometer on board ASTRO-E2**. *AAS/High Energy Astrophysics Division*, 35, 2003.

E. Figueroa-Feliciano, K. Boyce, J. Chervenak, F. Finkbeiner, R. Kelley, M. Lindeman, S. Porter, and C. K. Stahle. **Position-sensitive microcalorimeters for large-field high-energy resolution astrophysics.** In *X-Ray and Gamma-Ray Telescopes and Instruments for Astronomy*. Edited by Joachim E. Truemper, Harvey D. Tananbaum. *Proceedings of the SPIE*, volume 4851, pages 913–921, 2003.

E. Figueroa-Feliciano, R. Mushotzky, D. Davies, M. Loewenstein, and S. L. Snowden. **Groups and the entropy floor- XMM-Newton observations of four groups.** *AAS/High Energy Astrophysics Division*, 35, 2003.

M. A. Lindeman, S. R. Bandler, R. P. Brekosky, J. A. Chervenak, E. Figueroa-Feliciano, F. M. Finkbeiner, M. Galeazzi, and C. K. Stahle. **Probing the phase transition of Mo/Au TES microcalorimeters.** In *X-Ray and Gamma-Ray Telescopes and Instruments for Astronomy*. Edited by Joachim E. Truemper, Harvey D. Tananbaum. *Proceedings of the SPIE*, volume 4851, pages 957–964, 2003.

E. Figueroa-Feliciano. **Matching the science to the instrument: a study of a hybrid calorimeter design for Constellation-X.** In *American Physical Society, April Meeting, Jointly Sponsored with the High Energy Astrophysics Division (HEAD) of the American Astronomical Society*. Meeting ID: APR02, page 17023, 2002.

C. K. Stahle, C. A. Allen, K. R. Boyce, R. P. Brekosky, G. V. Brown, J. Cottam, E. Figueroa-Feliciano, M. Galeazzi, M. Jacobson, R. L. Kelley, D. Liu, D. McCammon, S. H. Moseley, F. S. Porter, W. T. Sanders, C. M. Stahle, A. E. Szymkowiak, P. Tan, and J. Vaillancourt. **The next generation of silicon-based x-ray microcalorimeters.** In *X-Ray and Gamma-Ray Telescopes and Instruments for Astronomy*. Edited by Joachim E. Truemper, Harvey D. Tananbaum. *Proceedings of the SPIE*, volume 4851, 2002.

E. Figueroa-Feliciano, C. K. Stahle, F. M. Finkbeiner, R. Kelley, M. A. Lindeman, F. S. Porter, N. Tralshawala, M. Li, and C. M. Stahle. **Mo/Au TES X-ray calorimeter with 2.8 eV resolution at 1.5 keV.** In *From X-rays to X-band: Space Astrophysics Detectors and Detector Technologies Conference*, STScI, Baltimore, MD, 2000.

E. Figueroa-Feliciano, C. K. Stahle, F. M. Finkbeiner, M. J. Li, M. A. Lindeman, N. Tralshawala, and C. M. Stahle. **Position-sensing transition-edge sensors for large-field high-energy-resolution x-ray imaging spectroscopy.** In *X-Ray and Gamma-Ray Instrumentation for Astronomy XI*. Edited by Kathryn A. Flanagan and Oswald H. Siegmund. *Proceedings of the SPIE*, volume 4140, pages 419–427, 2000.

C. K. Stahle, K. R. Boyce, S. Deiker, E. Figueroa-Feliciano, F. M. Finkbeiner, K. C. Gendreau, G. C. Hilton, K. D. Irwin, R. L. Kelley, M. A. Lindeman, J. M. Martinis, S. W. Nam, F. S. Porter, D. A. Rudman, A. E. Szymkowiak, and D. A. Wollman. **The development of TES x-ray calorimeter array systems**

suitable for Constellation-X. *AAS/High Energy Astrophysics Division*, 32, 2000.

C. K. Stahle, R. P. Brekosky, E. Figueroa-Feliciano, F. M. Finkbeiner, J. D. Gygax, M. J. Li, M. A. Lindeman, F. S. Porter, and N. Tralshawala. **Progress in the development of Mo/Au transition-edge sensors for x-ray spectroscopy**. In *X-Ray and Gamma-Ray Instrumentation for Astronomy XI*. Edited by Kathryn A. Flanagan and Oswald H. Siegmund. *Proceedings of the SPIE*, volume 4140, pages 367–375, 2000.

N. Tralshawala, M. Li, C. M. Stahle, R. Brekosky, E. Figueroa-Feliciano, F. M. Finkbeiner, and C. K. Stahle. **Development of close-packed microcalorimeter arrays using molybdenum-gold transition-edge sensors with bismuth absorbers**. In *From X-rays to X-band: Space Astrophysics Detectors and Detector Technologies Conference*, STScI, Baltimore, MD, 2000.

A. J. Miller, B. Cabrera, R. W. Romani, R. M. Clarke, E. Figueroa-Feliciano, and S. W. Nam. **Wideband observation of the Crab pulsar using a superconducting transition-edge sensor**. In *Ultraviolet and X-Ray Detection, Spectroscopy, and Polarimetry III*. Edited by Silvano Fineschi, Bruce E. Woodgate, and Randy A. Kimble. *Proceedings of the SPIE*, volume 3764, pages 188–194, 1999.

S. W. Nam, B. Cabrera, P. Colling, R. M. Clarke, E. Figueroa-Feliciano, A. J. Miller, and R. W. Romani. **A new biasing technique for transition edge sensors with electrothermal feedback**. In *IEEE Transactions of Applied Superconductivity*, volume 9, pages 4209–4212, 1999.

C. K. Stahle, S. Bandler, T. W. Barbee, J. W. Beeman, R. P. Brekosky, B. Cabrera, M. Cunningham, S. Deiker, E. Figueroa-Feliciano, F. M. Finkbeiner, M. A. Frank, K. C. Gendreau, E. E. Haller, G. C. Hilton, and K. D. Irwin. **Toward a 2-eV microcalorimeter x-ray spectrometer for Constellation-X**. In *Ultraviolet and X-Ray Detection, Spectroscopy, and Polarimetry III*. Edited by Silvano Fineschi, Bruce E. Woodgate, and Randy A. Kimble. *Proceedings of the SPIE*, volume 3765, pages 82–93, 1999.

R. W. Romani, B. Cabrera, E. Figueroa, A. J. Miller, and S. W. Nam. **TES spectrophotometers: First astronomical observations and future potential**. *Bulletin of the American Astronomical Society*, 30:1266, 1998.

E. Figueroa-Feliciano, F. R. Chang-Díaz, and J. P. Squire. **On the development of a magnetically vectored variable ISP plasma rocket**. *NASA University Research Centers Technical Conference*, Albuquerque, NM, 1997.

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